

**Carbon Monoxide Maintenance Provisions  
for Salt Lake City**

**Section IX, Part C.7**

Adopted by the Air Quality Board  
October 6, 2004

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### **IX.C.7.a Background**

The Environmental Protection Agency (EPA) approved a redesignation request and maintenance plan for Salt Lake City on January 21, 1999 (64 FR 3216), effective March 22, 1999. The action, which was adopted by the Utah Air Quality Board on September 4, 1996, established an attainment year of 1993, demonstrated maintenance through 2006, provided for the continuation of the Salt Lake County inspection and maintenance program, established a carbon monoxide mobile source emissions budget for a number of years for mobile sources (to be used in transportation conformity determinations), and established a contingency plan in the event a violation of the carbon monoxide standards or an exceedance of the 1993 planning cap was measured.

This revised maintenance plan provides for the continuation of the County's inspection and maintenance program as defined in Salt Lake City-County Health Department Ordinance #22A, revises the emission inventories and maintenance demonstration, revises the 2005 on-road mobile source carbon monoxide attainment emissions inventory for 1993, adds a mobile source emissions budget for 2019, and revises the contingency plan.

### **IX.C.7.b Emission Inventories and Maintenance Demonstration**

The emission inventories for the 1993 attainment year and the 2019 maintenance year are presented below in Tables 1 and 2. Each inventory accounts for the emission control programs effective during that period, and the following controls will continue to be implemented to ensure maintenance of the carbon monoxide standards through the year 2019.

- Federal Motor Vehicle Control Program.
- Stationary Sources. The Salt Lake City attainment/maintenance area is subject to the Prevention of Significant Deterioration permitting requirements of R307-405, the requirements of R307-401 and R307-403. R307-401:405 are already included in the State Implementation Plan. The maintenance plan makes no changes to these regulations.
- Improved Automobile Inspection and Maintenance Program. Salt Lake City-County Health Department Ordinance #22A. The program is set forth in SIP Section X.C, the Salt Lake County Vehicle I/M program, last approved by EPA on October 9, 2002, at 67 FR 62891.

Both inventories represent emissions on a typical winter weekday during the peak carbon monoxide season. (November through January for the respective year). These inventories use EPA-approved emissions modeling methods and the latest transportation data from the Wasatch Front Regional Council's (WFRC) 2004 - 2030 transportation plan found by the Federal Highways Administration on January 20, 2004, to conform to the state implementation plan. Demographic data was obtained from the Governor's Office of Planning and Budget. The inventories were developed by the Division of Air Quality (DAQ) in coordination with WFRC. Detailed information on model assumptions and parameters for each source category are found in the Technical Support Document at Tab 2.

The 1993 inventory included in the original 1996 Maintenance Plan indicated total winter weekday emissions of 225.73 tons, with 202.24 tons coming from on-road mobile sources. Table 1 below differs from that inventory because methodologies for collecting and estimating inventory data have changed since 1996. Therefore, the 1993 inventory has been re-calculated using current methods so that it can be compared with the projections for future years. Methodology changes are explained in the Technical Support Document at Tab 2. The principal factor is the difference between mobile source emission projections using the currently-approved MOBILE6.2 version of the model, compared to the now outdated MOBILE 5 version used in the 1996 submittal.

The newly-calculated 1993 inventory in Table 1 below indicates that total winter weekday emissions were 345.39 tons, with 295.21 tons coming from on-road mobile sources. Though the inventory appears to be considerably higher than the original inventory, it reflects the differences in the new MOBILE6.2 model; no additional emissions are included, and the monitoring data in IX.C.7.c below indicates that ambient concentrations of carbon monoxide have declined since 1993. This Plan constitutes a maintenance demonstration for carbon monoxide in Salt Lake City through 2019.

Tables 1 and 2 show the comparable inventories for 1993 and 2019. Figure 1 shows the proportion of carbon monoxide coming from each kind of source.

**Table 1. 1993 Attainment Year Carbon Monoxide Emission Inventory for the Salt Lake City Attainment/Maintenance Area.**

		<b>CO Emissions Tons/Winter Week Day</b>
<b>Area Sources</b>		
Agricultural Burning		n/d
Aircraft Maintenance		0.013
Coal Combustion-commercial		0.456
Coal Combustion-industrial		1.150
Coal Combustion-residential		0.024
Detonation		n/d
Firefighter Training		n/d
Forest Fires		n/d
Natural Gas Combustion-comm & Indus		1.485
Natural Gas Combustion-residential		0.879
Oil Combustion-commercial		0.042
Oil Combustion-residential		0.004
Open Burning		n/d
Orchard Heaters		n/d
Structural Fires		0.037
Vehicle Fires		0.009
Wood Combustion		11.245
	<i>Total Area Sources</i>	<b>15.344</b>
<b>Mobile Sources</b>		
	<i>Total On-road Sources</i>	<b>295.210</b>
On-Road		
Non-Road		
Aircraft		1.266
Railroad		0.184
Misc. Non--road Equipment		33.39
	<i>Total Non-road Sources</i>	<b>34.84</b>
<b>Point Sources</b>	<i>Total Point Sources</i>	0*
	<b>TOTAL 1993 Inventory</b>	<b>345.39</b>

Note: Numbers may vary slightly from report due to rounding

Numbers may not add due to rounding

n/d = negative declaration

\*There were no major CO point sources in the maintenance area in 1993; point source emissions are included in the Area Source inventory.

**Table 2. 2019 Attainment Year Carbon Monoxide Emission Inventory for the Salt Lake City Attainment/Maintenance Area.**

	<b>CO Emissions Tons/Winter Week Day</b>
<b>Area Sources</b>	
Agricultural Burning	n/d
Aircraft Maintenance	0.02
Coal Combustion-commercial	0.74
Coal Combustion-industrial	0.99
Coal Combustion-residential	0.04
Detonation	n/d
Firefighter Training	n/d
Forest Fires	n/d
Natural Gas Combustion-commercial	0.88
Natural Gas Combustion-industrial	n/d
Natural Gas Combustion-residential	0.82
Oil Combustion-commercial	0.01
Oil Combustion-residential	0.00
Open Burning	n/d
Orchard Heaters	n/d
Structural Fires	0.06
Vehicle Fires	0.01
Wood Combustion	3.77
<i>Total Area Sources</i>	<i>7.34</i>
<b>Mobile Sources</b> <i>Total On-road Sources</i>	<i>104.08</i>
On-Road	
Non-Road	
Aircraft	1.91
Railroad	0.22
Misc. Non-road Equipment	46.24
<i>Total Non-road Mobile</i>	<i>48.37</i>
<b>Point Sources</b> <i>Total Point Sources</i>	<i>0*</i>
<b>Total Salt Lake Emissions</b>	<b>159.79</b>

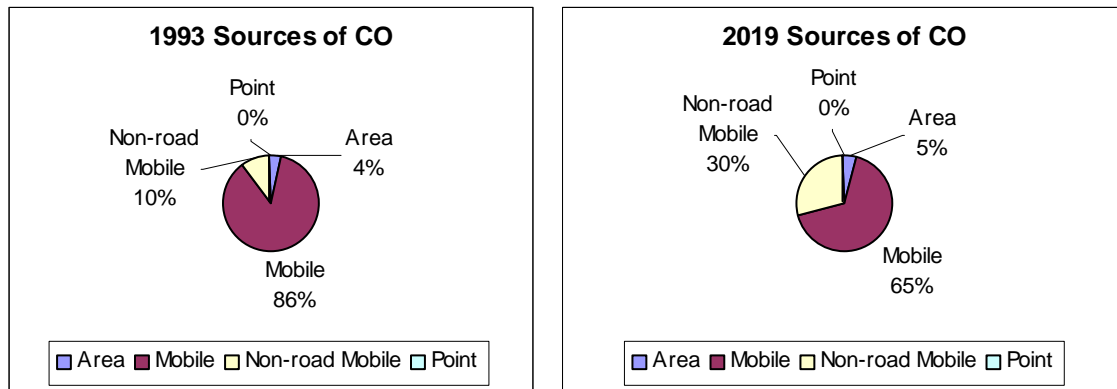
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n/d = negative declaration

\*There were no major CO point sources in the maintenance area in 1993;  
point source emissions are included in the Area Source inventory.

**Figure 1. 1993 and 2019 CO Emission Sources in Salt Lake City**



DAQ also performed an analysis that shows the projected levels of emissions for the years 2004, 2005, 2008, 2011, 2014 and 2017 are below the 1993 attainment inventory as shown in Table 3. The details are found in the Technical Support Document at Tab 2. These years were selected to demonstrate that Salt Lake City will not experience an unexpected increase in emissions prior to the 2019 maintenance year. Included in the analysis is a change in the Salt Lake County vehicle inspection and maintenance program that was adopted by the Utah Legislature that allows vehicles six years old and newer to be inspected every other year instead of annually. As the projections demonstrate, this change in the I/M program does not endanger attainment of the standard.

**Table 3. Emissions Projections for Interim Years.**

	Area	Mobile	Non-road	Point*	TOTAL
1993	15.34	295.21	34.84	0.00	345.39
2004	7.57	176.14	38.52	0.00	222.23
2005	7.54	168.66	39.23	0.00	215.43
2008	7.48	130.01	41.13	0.00	178.62
2011	7.50	118.19	43.08	0.00	168.77
2014	7.49	110.30	45.02	0.00	162.81
2017	7.42	106.35	47.01	0.00	160.78
2019	7.34	104.08	48.37	0.00	159.79

Note: Numbers may vary slightly from report due to rounding

Numbers may not add due to rounding

n/d = negative declaration

\*There were no major CO point sources in the maintenance area in 1993; point source emissions are included in the Area Source inventory.

As Tables 1, 2 and 3 indicate, projections for 2019 CO emissions are below 1993 attainment year levels - there are 185.60 fewer tons of CO emitted each day in 2019 than in 1993 (345.39 tpd - 159.79 tpd = 185.60 tpd). Thus, maintenance of the CO NAAQS in Salt Lake City is demonstrated through 2019. Figure 1 illustrates how CO emissions sources change between 1993 and 2019.

### IX.C.7.c Monitored Data

Salt Lake City has never measured an exceedance of the National Ambient Air Quality Standard of 35 ppm (one-hour average). A violation of the eight-hour standard occurs when the 2<sup>nd</sup> highest monitored value at a monitoring site exceeds 9 ppm. Table 4 below displays the eight-hour monitored data for stations in Salt Lake City from the attainment year of 1993 through 2003. No violation of the eight-hour standard of 9 ppm has been measured during this period.

**Table 4. 8- Hour Monitoring Data at Salt Lake City Stations 1993 - 2003  
( in ppm)**

	State Street #2		State Street #3		Hawthorne	
	Max	2 <sup>nd</sup> High	Max	2 <sup>nd</sup> High	Max	2 <sup>nd</sup> High
1993	7.5	6.5				
1994	8.4	6.8	10	7.7		
1995	5.1	4.6	5.9	5.5		
1996			7.6	6.9		
1997			7.3	6.5	7.1	6.5
1998			6.4	5.7	6.1	5.2
1999			5.2	5.2	5.8	5.7
2000			5.1	5	5.2	4.9
2001			4.3	4.1	4.7	4.7
2002			3.9	3.8	3.7	3.7
2003			4.3	4.3	4.3	4.2

### IX.C.7.d Mobile Source Carbon Monoxide Emissions Budget for Transportation Conformity

The transportation conformity provisions of section 176(c)(2)(A) of the CAA require regional transportation plans and programs to show that "...emissions expected from implementation of plans and programs are consistent with estimates of emissions from motor vehicles and necessary emissions reductions contained in the applicable implementation plan..."

The federal conformity rule (40 CFR Part 93, Subpart A) and its preamble (58 FR 62193) indicate that motor vehicle emission budgets must be established for the last year of the maintenance plan, and may be established for any years deemed appropriate. If the maintenance plan does not establish motor vehicle emissions budgets for any years other than the last year of the maintenance plan, the conformity regulation requires that a "demonstration of consistency with the motor vehicle emissions budgets must be accompanied by a qualitative finding that there are not factors which would cause or contribute to a new violation or exacerbate an existing violation in the years before the last year of the maintenance plan." (40 CFR 93.118(b)(2)(ii), August 15, 1997) The normal interagency consultation process required by the regulation establishes what must be considered in order to make such a finding.

For transportation plan analysis years following the last year of the maintenance plan (in this case 2019), a conformity determination must show that emissions are less than or equal to the maintenance plan's motor vehicle emissions budget(s) for the last year of the implementation plan. EPA's conformity regulation (40 CFR 93.124) also allows the implementation plan to



quantify explicitly the amount by which motor vehicle emissions could be higher while still demonstrating compliance with the maintenance requirement. The implementation plan can then allocate some or all of this additional "safety margin" to the emissions budgets for transportation conformity purposes.

### **Salt Lake City Mobile Source CO Emissions Budgets**

This plan retracts the emissions budgets for 2005 - 2016 that were included in the original Salt Lake City Carbon Monoxide Maintenance Plan submitted to EPA in 1996. These numbers were based on the emissions projections of an earlier version of the MOBILE model, and are no longer accurate. In this maintenance plan, the State is establishing transportation conformity motor vehicle emission budgets (MVEB) for 2005 and 2019, based on the current MOBILE6.2 model.

### **CO Emissions Budgets**

As presented in Table 3, total 1993 emissions were 345.39 tons per day. In that year, the second-high monitored value was 6.5 ppm, as shown in Table 4.

As presented in Table 3, projected emissions for 2005 are 215.43. The difference between the 1993 total of 345.39 and the projection of 215.43 tpd for 2005, the documentable portion of the safety margin, is 129.96 tpd. WFRC has requested a Motor Vehicle Emissions Budget (MVEB) of 168.66 tons per day for 2005; the Air Quality Board is allocating an additional 109.96 tpd from the safety margin to the MVEB. The remaining 20 tpd from the safety margin is retained to allow for potential variations in emissions from non-road and area sources. Therefore, the MVEB for 2005 is 278.62 tons per day.

Projected emissions for 2019, shown in Table 3, total 159.79 tons per day. The difference between the 1993 total of 345.39 and the projection of 159.79 tpd for 2019, the documentable portion of the safety margin, is 185.60 tpd. WFRC has projected a need for 104.08 tons per day for 2019; the Air Quality Board is allocating an additional 174.54 tpd from the safety margin to the MVEB. The remaining 11.06 tpd from the safety margin is retained to allow for potential variations in emissions from non-road and area sources. Therefore the MVEB for 2019 is 278.62 tons per day.

These new MVEB will take effect for future transportation conformity determinations upon approval of this Maintenance Plan by EPA.

Pursuant to 40 CFR 93.102(b)(3), no further conformity determinations for the Salt Lake County CO maintenance area will be necessary after March 22, 2019.

### **IX.C.7.e Monitoring Network/Verification of Continued Attainment**

Utah will continue to operate an appropriate air quality monitoring network of NAMS and SLAMS monitors in accordance with 40 CFR Part 58 to verify the continued attainment of the CO NAAQS, and will gain EPA approval before making any changes to the Salt Lake City monitoring network. If measured mobile source parameters (e.g., vehicle miles traveled, congestion, fleet mix, etc.) change significantly over time, DAQ will perform a saturation monitoring study to determine whether additional and/or re-sited monitors are necessary.

Annual review of the NAMS/SLAMS air quality surveillance system will be conducted in accordance with 40 CFR 58.20(d) to determine whether the system continues to meet the monitoring objectives presented in Appendix D of 40 CFR Part 58.

### **IX.C.7.f Contingency Provisions**

Section 175A(d) of the Clean Air Act requires that the maintenance plan contain contingency provisions to ensure that the State will promptly correct any violation of CO NAAQS that occurs in the Salt Lake City attainment/maintenance area. Attainment areas are not required to have pre-selected contingency measures and this plan removes the regulatory requirement for Alternative Commuting Options as the primary contingency measure and an enhanced inspection and maintenance program as a secondary contingency measure.

The contingency plan should ensure that the contingency measures are adopted expeditiously once the need is triggered. The primary elements of the contingency plan involve the tracking and triggering mechanisms to determine when contingency measures are needed and a process for implementing appropriate control measures.

#### **(1) Tracking**

The tracking plan for Salt Lake City will consist of 1) CO monitoring by DAQ and 2) analysis of CO concentrations, VMT and population growth. In accordance with 40 CFR Part 58, DAQ will continue to operate and maintain a Salt Lake City carbon monoxide monitoring network. Since revisions to the region's transportation improvement programs are prepared every two years, and must go through the transportation conformity finding, this process will be used to periodically review progress toward meeting the mobile source emissions projections in this maintenance plan.

#### **(2) Trigger and Response**

Triggering of the contingency plan does not automatically require a revision of the SIP nor is Salt Lake City necessarily redesignated once again to nonattainment. Instead, DAQ will normally have an appropriate time-frame to correct the violation with implementation of one or more adopted contingency measures. In the event that violations continue to occur, additional contingency measures will be adopted until the violations are corrected.

Upon notification of a CO NAAQS exceedance, DAQ and WFRC will develop appropriate contingency measure(s) intended to correct a violation of the CO NAAQS standard. Information about historical exceedances of the standard, the meteorological conditions related to the recent exceedance(s), and the most recent estimates of growth and emissions will be reviewed. (Notification to the Salt Lake City government and to EPA, of any exceedance will generally occur within 30 days, but no more than 45 days.) This process will be completed within six months of the exceedance notification. If a violation of the CO NAAQS has occurred (a violation occurs when a second exceedance within one calendar year is recorded at a monitoring site), a public hearing process at the State and local level will begin. If the Air Quality Board agrees that the implementation of local measures will prevent further exceedances or violations, the Board may endorse or approve of the local measures without adopting State requirements. If, however, DAQ finds locally adopted contingency measures to be inadequate, DAQ will recommend to the Board that they adopt state-enforceable measures as deemed necessary to prevent additional exceedances or violations. Contingency measures will be adopted and fully implemented within

one year of a CO NAAQS violation. Any state-enforceable measures will become part of the next revised maintenance plan submitted to EPA for approval.

### **(3) List of Potential Contingency Measures**

The State, in consultation with the WFRC and Salt Lake City officials, will choose one or more of the following contingency measures. Measures will be chosen to bring the area back into compliance quickly, and to meet the specific needs of Salt Lake City. It is likely that no federal money will be available to fund the implementation of the selected contingency measure(s). Most, if not all, of the costs will be borne by local citizens and Salt Lake City, local industries, and state government agencies.

- A return to annual inspections for all vehicles. In the current plan, vehicles six years old and newer are required to be inspected every other year.
- Improving the current I/M program in the Salt Lake City area, such as:
  - increase the maximum repair cost limits or totally eliminate emissions test waivers for vehicles that have failed the test, as allowed by statute,
  - increase the stringency of vehicle cut points,
  - use of remote sensing to detect high emission vehicles. This option would be added to the current I/M requirements (i.e., no one vehicle currently required to be inspected would be allowed to skip the regular inspection). The primary purpose would be to identify dirty vehicles not registered or otherwise captured in the current program.
- Mandatory Employer-Based Travel Reduction Programs as allowed by statute.
- Other emission control measures appropriate for the area based on consideration of cost-effectiveness, CO emission reduction potential, economic and social considerations, or other factors that the State deems to be appropriate.

### **IX.C.7.g Subsequent Maintenance Plan Revisions**

No maintenance plan revision will be needed after 2019, as that is the 20th year following EPA approval of the original maintenance plan. No further maintenance plan is needed after successful maintenance of the standard for 20 years. However, the State will update the Plan if conditions warrant.